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him originally fastened, as Prometheus was, to his sandstone ledge. Still, amid the snows of age, he hears the wail of the pitying unhelpful chorus, his last time-worn lullaby.

John Sterling had an excellent literary working talent, even if his manner surpasses his matter. He would have loved to be a pagan, but the dullness of the English liturgy crowded it out.

Keats's letters discover a kindly disposition for a poet. A driving, drifting, unmoored nature, with a partial exploration in the world around or within. He was a prospective madman, and died somewhat madly, though otherwise fatally diseased, of that yellow rattlesnake.—*Gifford.*

The poverty of a man's circumstance exfoliates from the poverty of his understanding. Day by day our possessions contract; to-morrow, we are bankrupts.

## *ON THE STUDY OF PHYSICS AND CHEMISTRY.*

TRANSLATED FROM THE GERMAN OF F. W. J. VON SCHELLING, BY ELLA S. MORGAN.

[THE TWELFTH "ACADEMIC LECTURE."]

Particular phenomena and forms, which can be cognized only by experience, are necessarily preceded by that through which they are, namely, by matter or substance. Empiricism knows them only as bodies, that is, as matter with variable form; and even conceives ultimate matter, if it refers to it at all, as an indeterminate number of bodies of unchangeable form, which are therefore called atoms. Hence empiricism has no knowledge of the first unity, out of which everything in nature proceeds, and into which all returns.

In order to reach the essence of matter we must avoid the image of every particular form of it; for instance, every conception of matter as so-called inorganic or organic, because matter in itself is only the common source of these different forms. Considered absolutely it is the act of eternal self-contemplation of the absolute, in so far as it makes itself objective and real in this act. To show this being-in-itself of matter, as well as the way in which particular things with the determinations of phenomena proceed out of it, is the province of philosophy.

Of the former (the being-in-itself of matter) I have spoken at length in the preceding lectures, and will therefore confine myself to the latter. The idea of every particular thing is simply one, and the one idea is sufficient to the becoming of an infinite number of things of the same kind—its infinite capacity not being exhausted by any amount of realization. Since the first law of the absolute is that it is indivisible, the particularity of ideas cannot consist in a negation of other ideas, but consists in this, namely, that all is imaged in each in accordance with its particular form. This order in the world of ideas must be taken as the archetype of the knowledge of things of the visible world. Here, also, the first forms will be unities which contain within themselves all other forms as particulars, and produce them. Hence, for this reason, they themselves will appear as universals. The way in which they pass over into extension and fill space must be derived from the eternal form of the reflection of unity in multiplicity, which in the ideas are one with the contrary (as shown), but which in phenomena are differentiated. The first and universal type of space-contents is necessarily, that just as the sensuous unities proceed as ideas out of the absolute as center, so as phenomena they are born from a common central point, or—since each idea is itself productive and may be a center—from common central points, and, like their types, are dependent and independent at the same time.

Next to the construction of matter, therefore, the knowledge of the creation of the world and its laws is the first and greatest in physics. It is well known that what the mathematical theory of nature has accomplished, since the time when Kepler's divine genius announced the laws known as Kepler's laws, is that it attempted a construction of nature entirely empirical in principle. It may be accepted as a general rule, that everything in any given construction which is not pure universal form can have neither scientific value nor truth. The basis from which the centrifugal motion of celestial bodies is derived is no necessary form ; it is an empirical fact. The Newtonian force of attraction, although, for the consideration which adheres to the standpoint of reflection, it may be a necessary presumption, is for the reason which knows only absolute relations, and hence also for construction, of no importance. The reasons for Kepler's laws may be seen, without any empirical addition, from the theory of ideas and the two unities which in themselves form one unity, and by reason of which every being while absolute in itself is at the same time in the absolute, and *vice versa.*

Physical astronomy, or the science of the particular qualities and relations of the heavenly bodies, rests, as to its great principles, entirely upon general views, and, with regard to the planetary system especially, it depends upon the harmony which exists between the latter and the products of the earth.

The celestial body resembles the idea, whose copy it is, in this, that the former like the latter is productive and brings forth all forms of the universe out of itself. Matter, although as phenomenon it is the body of the universe, again differentiates itself into soul and body. The body of matter consists of isolated particular things in which the unity is wholly lost in multiplicity and extension, and which therefore appear as inorganic.

The pure historical presentation of inorganic forms has been made a special branch of knowledge, instinctively avoiding any appeal to internal, qualitative determinations. When the specific differences of matter itself have once been comprehended quantitatively, and there is the possibility of presenting it by means of mere changes of form as a metamorphosis of one and the same substance, then the way is opened to an historical construction of the system of bodies, a decided beginning having already been made through Steffens's ideas.

Geology, which should have the same idea in reference to the whole earth, should not exclude any of its products, and should demonstrate the genesis of everything in historical continuity and predetermined change. Since the real side of science must always be historical (because outside of science there is nothing which rests originally and only on truth, except history), so geology in the completeness of the highest development, as history of nature itself, for which the earth is only the middle and starting point, would be the true integration and pure objective presentation of the science of nature, to which experimental physics forms but the transition and the means.

As physical things are the body of matter, so the soul which is reflected in it is the light. Through its relation to the difference, and as immediate idea of the same, the ideal itself becomes finite and appears subordinately in extension as an ideal, which describes space but does not fill it. Hence, in the phenomenon itself it is the ideal, but not the whole ideal of the act of subject become object (since it leaves the one phase outside itself in the corporeal), it is the mere relative ideal.

The knowledge of light is like the knowledge of matter, is indeed one with it, since both exist only in contrast one with the other (can be truly comprehended as the subjective and objective side). Since this spirit of nature has gone away from physics, its life in all its members is extinguished, for there is no possible transition from universal to organic nature. The Newtonian theory of optics is the greatest proof of the possibility of a whole structure being made up of wrong conclusions, all parts of which were based on experience and experiment—as if it were not more or less consciously the existing theory which arbitrarily determines the meaning and the result of experiments. Unless a rare but happy instinct or a general schematism gained through construction directs the natural order, experiment, which may teach particular things but can never give a complete view, is regarded as the infallible principle of the knowledge of nature.

The germ of the earth is unfolded only by the light. For matter must become form and pass into particularity in order that light, as being and universal somewhat, may appear.

The universal form of the particularization of body is that through which they are identical and mutually dependent. From the relations to this universal form, which is the reflection of unity in difference, must be inferred all specific difference of matter.

The procedure from identity is, in respect to all things, immediately and at the same time an aspiration toward unity, which is their ideal side, that which animates them.

To represent the essence of living phenomena of bodies is, next to the objects we have already pointed out, the highest and only object of physics, even when conceived with the ordinary limitation and separation from the science of organic nature.

Those phenomena, as the expressions of activity essentially inherent in bodies, have been called dynamic, just as the including whole of the same according to their different determined forms is called the dynamic process.

It is necessary that these forms should be confined to a certain circle and conform to a general type. Only when in possession of such a circle can one be certain neither to overlook a necessary link nor to mistake appearances which are essentially one. With regard to the multiplicity and unity of these forms ordinary experimental physics is in the greatest uncertainty, so that every new kind of phenomenon becomes a reason for the adoption of a new principle, differing from all others, inferring one form from another *ad libitum*.

If we measure the current theories and mode of explanation of those phenomena in general by the standard already determined, in none of them do we find a necessary and universal form, but all are accidental. For there is no necessity that there should exist such imponderable fluids as are supposed, and it is wholly accidental that these should be so constituted that their homogeneous elements repel and their heterogeneous elements attract each other, as is assumed in explanation of magnetic and electric phenomena. If the world is made up of these hypothetical elements, we get the following image of its constitution : First, in the pores of coarser matter we find air, in the pores of the air we find heat, in the pores of the latter the electric fluid, which again includes the magnetic fluid, and this again contains the æther within its spaces. At the same time these different fluids, contained one within another, do not disturb each other, and each manifests itself after its kind according to the pleasure of the physicist, without any admixture with the others, and each finds its place again without any complication with the rest.

This explanation, besides the fact that it has no scientific value, is not even capable of being perceived empirically.

From the Kantian construction of matter was next developed a higher view directed against the material consideration of phenomena, but, in everything which it advanced in opposition, itself remained upon too low a standard. The two forces of attraction and repulsion, as Kant defined them, are mere formal factors, conceptions of the understanding found by analysis, which give no ideas adequate to the life and diversity of matter. These are not to be discovered in the relation of these forces, which Kant knew only as a mere arithmetical relation. The followers of Kant and the physicists who attempted an application of his theories, confined themselves to a negative attitude toward the dynamic view, as in regard to light they thought they had announced a higher theory than when they described it as altogether immaterial, which then agreed, it is true, with every other mechanical hypothesis—for instance, those of Euler and others.

The common error which lay at the basis of all these views is the conception of matter as pure reality. The universal subject-objectivity of things, and especially of matter, must be scientifically restored before these forms, in which its inmost life expresses itself, can be understood.

The being of everything in identity as the universal soul, and the tendency to reunite with it when it is placed outside of the unity, is the universal ground of living phenomena, as has been already indicated in the preceding lectures. The particular forms of activity are none of them accidental forms of matter, but are the original, inborn, and necessary forms. For, as the unity of the idea in being expands to three dimensions, so life and activity express themselves in the same type and through three forms, which accordingly are just as necessarily inherent in the being of matter. By means of this construction it is not only certain that there are only these three forms of the living motion of bodies, but the universal law is found for all particular determinations of the same, from which they can be seen as equally necessary.

I here confine myself to the chemical process, because the science of its phenomena has been made a special branch of natural science.

In modern times, the relation of physics to chemistry has ended almost in a complete subordination of the former to the latter. The key to the explanation of natural phenomena, even the higher forms, magnetism, electricity, etc., should be given in chemistry, and the more all explanation of Nature has been brought back to chemistry, the more it has lost all means of comprehending its own phenomena from the early beginnings of science, when the conception of the inner unity of all things lay nearer the human spirit. The chemistry of the present day has retained several figurative expressions, such as affinity, etc., which, however, far from being the intimation of an idea, have become only sanctuaries of ignorance. The supreme principle and the extreme limit of all knowledge have become more and more things to be recognized by weight (gravity), and those potent inborn spirits of nature which produce indestructible qualities have become mere matter which could be caught and held in vessels.

I do not deny that modern chemistry has enriched us with many facts, although it is still to be desired that this new world had been discovered from the beginning by a higher organ, and it is a ridiculous conceit that the stringing together of those facts, held together by the unmeaning words matter, attraction, etc., forms a theory, for they have not an idea of quality, of combination, of analysis, etc.

It may be advantageous to treat chemistry separately from physics, but it must then be considered as a mere experimental art, with no pretension to science. The construction of chemical phenomena does not belong to a special science, but to a general, comprehensive science of Nature, in which it is recognized as one manner of manifestation of the universal life of Nature, not as phenomena of a peculiar law of conformity, independent of the connection of the whole.

The presentation of the general dynamic process which takes place in the world system, and with respect to the whole earth, is meteorology in the broadest sense, and is so far a part of physical astronomy as the general changes of the earth can be comprehended only through its relation to the general world system.

With regard to mechanics, of which a large part is accepted in physics, it belongs to applied mathematics; but the universal type of its forms, expressed as purely objective, is prescribed by physics; they are as it were the dead forms of the dynamic process.

The province of the latter physics in its ordinary separation is limited to the sphere of the general antithesis between light and matter or gravity. The absolute science of Nature comprehends in one and the same whole as well these phenomena of separated unities as those of the higher organic world, through whose products the entire subject-objectivation manifests itself in its two sides at one and the same time.

## *A NEW WORK ON KANT.*

Professor John Watson, of Queen's University, Kingston, Canada, has a new book in press, entitled, "Kant and his English Critics," which will appear, it is expected, about the first of next year from the press of M. Macehose, of Glasgow. The book will defend the Critical Philosophy against Empirical Psychology, and will contain a criticism of the latter in its main features, showing, however, that Kant's theory must be freed from certain unwarrantable assumptions which destroy its unity. Our readers are fully familiar with the vigorous thought of Professor Watson, and will welcome a treatise from him on a theme so important.